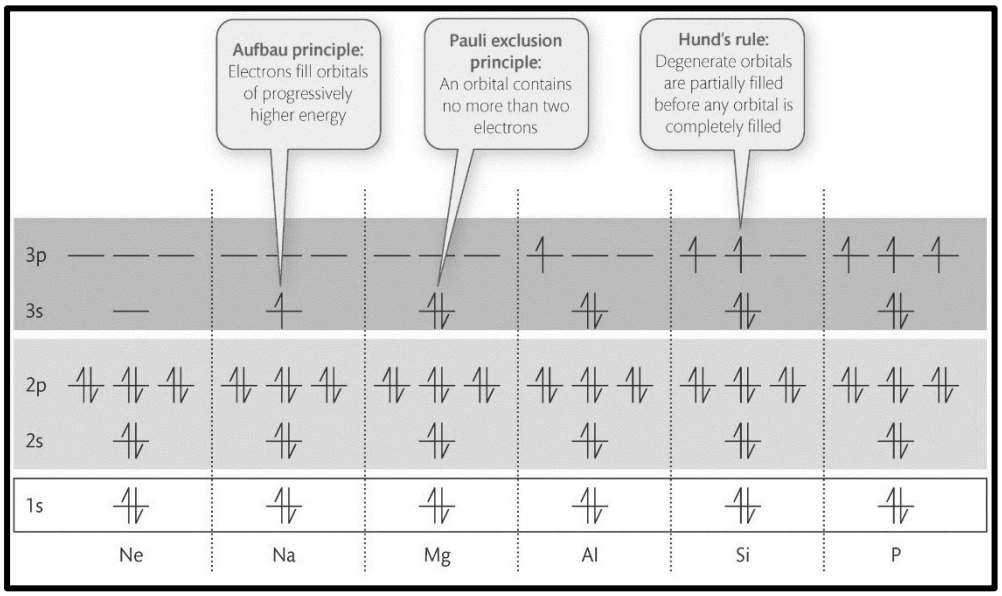
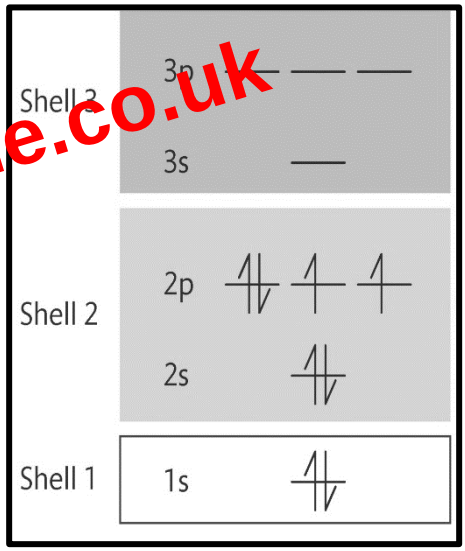
- The following image demonstrates all 3 previously discussed principals:
  - **The horizontal lines represent an orbital**
  - **Each half-arrow represents an electron**



- The most outer shell which houses electrons is known as the **Valence Shell**
  - It is the outer perimeter of the atom
    - For example, oxygen has 8 electrons and would look like this graphically:
    - Therefore, the electron configuration would be noted as $\mathbf{1s^2 2s^2 2p^4}$



- **The number of electrons in the element increases by 1 as you move from left to right** across a period
  - E.g. carbon has 6, nitrogen has 7 and oxygen has 8
    - **Elements from the same group have the same number of valence electrons**
      - E.g. hydrogen, lithium and sodium all have 1 valence electron
      - **This means that they are likely to exhibit similar degrees of chemical reactivity**

- Atoms **can gain or lose electrons**, this is a process known as **ionisation**
  - The addition of an electron turns the atom negative, into an **anion**
  - The removal of an electron turns the atom positive, into a **cation**
  - **Ionisation energy** determines how easily an atom will lose an electron
    - This becomes progressively **more difficult as you move across the periodic table**
      - Therefore, **atoms on the left side of the table are significantly more reactive** than the right side
    - This process has become the basis of some analytical techniques such as **mass spectroscopy**